

IN THE CLAIMS:

Please amend Claims 1, 13, 25 and 37 as follows and add new Claims 49 to 52 as shown below. The claims, as pending in the subject application, read as follows:

1. (Currently Amended) A method of identifying and classifying data obtained by the amplification of polymorphic nucleic acids in order to identify alleles, comprising the steps of:

performing a gel electrophoresis process on polymorphic nucleic acid material and generating a machine-readable image of results of the electrophoresis process, wherein the machine-readable image is in a spatial domain of size versus intensity;

executing a frequency transform on the spatial domain machine-readable image to transform the spatial domain machine-readable image to a frequency domain, thereby obtaining frequency coefficients corresponding to spatial domain values; and

executing a pattern-based classification process on the frequency coefficients in order to distinguish alleles from background signals of PCR processing.

2. (Canceled)

2. (Previously Presented) A method according to Claim 1, further comprising performing a normalization process on the spatial domain machine-readable image prior to the transforming step.

4. (Canceled)

3. (Previously Presented) A method according to Claim 1, wherein the transforming step comprises subjecting the spatial domain machine-readable image to a Hadamard transform.

4. (Previously Presented) A method according to Claim 1, wherein the transforming step comprises subjecting the spatial domain machine-readable image to a Fourier transform.

5. (Previously Presented) A method according to Claim 1, wherein the transforming step comprises subjecting the spatial domain machine-readable image to a wavelet transform.

6. (Previously Presented) A method according to Claim 1, further comprising performing a data reduction process on the frequency coefficients so as to reduce the number of frequency coefficients utilized in the classification process.

7. (Previously Presented) A method according to Claim 1, wherein less than all of the frequency coefficients are used in the classification process.

8. (Previously Presented) A method according to Claim 1, wherein the classification process comprises processing the frequency coefficients in a connectionist neural network algorithm.

9 11. (Previously Presented) A method according to Claim 1, wherein the classification process comprises processing the frequency coefficients in a feedforward, backpropagation connectionist algorithm.

10 12. (Previously Presented) A method according to Claim 1, wherein the classification process comprises processing the frequency coefficients in a classification tree / rule induction algorithm.

12 13. (Currently Amended) An apparatus for identifying and classifying data obtained by the amplification of polymorphic nucleic acids in order to identify alleles, comprising:

a memory that stores executable process steps; and
a processor that executes the executable process steps, wherein the executable process steps comprise (a) generating a machine-readable image in a spatial domain of size versus intensity, the machine-readable image being generated from results of a gel electrophoresis process performed on polymorphic nucleic acid material, (b) executing a frequency transform on the spatial domain machine-readable image to transform[[ing]] the spatial domain machine-readable image to a frequency domain, thereby obtaining frequency coefficients corresponding to spatial domain values, and (c) executing a pattern-based classification process on the frequency coefficients in order to distinguish alleles from background signals of PCR processing.

14. (Canceled)

13 ~~15~~ (Previously Presented) An apparatus according to Claim ~~13~~¹², further comprising performing a normalization process on the spatial domain machine-readable image prior to the transforming step.

16. (Canceled)

14 ~~17~~ (Previously Presented) An apparatus according to Claim ~~13~~¹², wherein the transforming step comprises subjecting the spatial domain machine-readable image to a Hadamard transform.

15 ~~18~~ (Previously Presented) An apparatus according to Claim ~~13~~¹², wherein the transforming step comprises subjecting the spatial domain machine-readable image to a Fourier transform.

16 ~~19~~ (Previously Presented) An apparatus according to Claim ~~13~~¹², wherein the transforming step comprises subjecting the spatial domain machine-readable image to a wavelet transform.

17 ~~20~~ (Previously Presented) An apparatus according to Claim ~~13~~¹², further comprising performing a data reduction process on the frequency coefficients so as to reduce the number of frequency coefficients utilized in the classification process.

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18 21. (Previously Presented) An apparatus according to Claim 13, wherein less than all of the frequency coefficients are used in the classification process.

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19 22. (Previously Presented) An apparatus according to Claim 13, wherein the classification process comprises processing the frequency coefficients in a connectionist neural network algorithm.

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20 23. (Previously Presented) An apparatus according to Claim 13, wherein the classification process comprises processing the frequency coefficients in a feedforward, backpropagation connectionist algorithm.

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21 24. (Previously Presented) An apparatus according to Claim 13, wherein the classification process comprises processing the frequency coefficients in a classification tree / rule induction algorithm.

23 25. (Currently Amended) Computer-executable process steps for identifying and classifying data obtained by the amplification of polymorphic nucleic acids in order to identify alleles, the executable process steps comprising:

generating a machine-readable image in a spatial domain of size versus intensity, the machine-readable image being generated from results of a gel electrophoresis process performed on polymorphic nucleic acid material;

executing a frequency transform on the spatial domain machine-readable image to transform the spatial domain machine-readable image to a frequency domain, thereby obtaining frequency coefficients corresponding to spatial domain values; and executing a pattern-based classification process on the frequency coefficients in order to distinguish alleles from background signals of PCR processing.

26. (Canceled)

~~24~~ ~~27~~. (Previously Presented) Computer-executable process steps according to ~~23~~ Claim ~~28~~, further comprising performing a normalization process on the spatial domain machine-readable image prior to the transforming step.

28. (Canceled)

~~25~~ ~~29~~. (Previously Presented) Computer-executable process steps according to ~~23~~ Claim ~~28~~, wherein the transforming step comprises subjecting the spatial domain machine-readable image to a Hadamard transform.

~~26~~ ~~30~~. (Previously Presented) Computer-executable process steps according to ~~23~~ Claim ~~28~~, wherein the transforming step comprises subjecting the spatial domain machine-readable image to a Fourier transform.

27 31. (Previously Presented) Computer-executable process steps according to
Claim 25, wherein the transforming step comprises subjecting the spatial domain machine-
readable image to a wavelet transform.

28 32. (Previously Presented) Computer-executable process steps according to
Claim 25, further comprising performing a data reduction process on the frequency
coefficients so as to reduce the number of frequency coefficients utilized in the
classification process.

29 33. (Previously Presented) Computer-executable process steps according to
Claim 25, wherein less than all of the frequency coefficients are used in the classification
process.

30 34. (Previously Presented) Computer-executable process steps according to
Claim 25, wherein the classification process comprises processing the frequency
coefficients in a connectionist neural network algorithm.

31 35. (Previously Presented) Computer-executable process steps according to
Claim 25, wherein the classification process comprises processing the frequency
coefficients in a feedforward, backpropagation connectionist algorithm.

32 36. (Previously Presented) Computer-executable process steps according to
Claim 25, wherein the classification process comprises processing the frequency
coefficients in a classification tree/ rule induction algorithm.

34 37. (Currently Amended) A computer-readable medium which stores
computer-executable process steps for identifying and classifying data obtained by the
amplification of polymorphic nucleic acids in order to identify alleles, the computer-
executable process steps comprising:

generating a machine-readable image in a spatial domain of size versus
intensity, the machine-readable image being generated from results of a gel electrophoresis
process performed on polymorphic nucleic acid material;

executing a frequency transform on the spatial domain machine-readable
image to transform the spatial domain machine-readable image to a frequency domain,
thereby obtaining frequency coefficients corresponding to spatial domain values; and

executing a pattern-based classification process on the frequency
coefficients in order to distinguish alleles from background signals of PCR processing.

38. (Canceled)

35 39. (Previously Presented) A computer-readable medium according to
Claim 37, further comprising performing a normalization process on the spatial domain
machine-readable image prior to the transforming step.

40. (Canceled)

~~36~~³⁴ 41. (Previously Presented) A computer-readable medium according to
Claim ~~37~~³⁴, wherein the transforming step comprises subjecting the spatial domain machine-
readable image to a Hadamard transform.

~~37~~³⁴ 42. (Previously Presented) A computer-readable medium according to
Claim ~~37~~³⁴, wherein the transforming step comprises subjecting the spatial domain machine-
readable image to a Fourier transform.

~~38~~³⁴ 43. (Previously Presented) A computer-readable medium according to
Claim ~~37~~³⁴, wherein the transforming step comprises subjecting the spatial domain machine-
readable image to a wavelet transform.

~~39~~³⁴ 44. (Previously Presented) A computer-readable medium according to any
Claim ~~37~~³⁴, further comprising performing a data reduction process on the frequency
coefficients so as to reduce the number of frequency coefficients utilized in the
classification process.

~~40~~³⁴ 45. (Previously Presented) A computer-readable medium according to
Claim ~~37~~³⁴, wherein less than all of the frequency coefficients are used in the classification
process.

41 46. (Previously Presented) A computer-readable medium according to
Claim 37, wherein the classification process comprises processing the frequency
coefficients in a connectionist neural network algorithm.

34 42 47. (Previously Presented) A computer-readable medium according to
Claim 37, wherein the classification process comprises processing the frequency
coefficients in a feedforward, backpropagation connectionist algorithm.

34 43 48. (Previously Presented) A computer-readable medium according to
Claim 37, wherein the classification process comprises processing the frequency
coefficients in a classification tree/ rule induction algorithm.

11 49. (New) A method according to Claim 1, wherein the polymorphic
nucleic acids comprise one of DNA, RNA, tRNA, mRNA and rRNA.

22 50. (New) An apparatus according to Claim 13, wherein the polymorphic
nucleic acids comprise one of DNA, RNA, tRNA, mRNA and rRNA.

33 51. (New) Computer-executable process steps according to Claim 26,
wherein the polymorphic nucleic acids comprise one of DNA, RNA, tRNA, mRNA and
rRNA.

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44 52. (New) A computer-readable medium according to Claim 37, wherein
the polymorphic nucleic acids comprise one of DNA, RNA, tRNA, mRNA and rRNA.